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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|---------------------------------|
| 10/635,101 | 08/06/2003 | Michael T. Meyer | 16380-4 | 6944 |
| 7590 | 05/24/2005 | | | EXAMINER THOMPSON, GREGORY D |
| Clifford W. Browning Bank One Center/Tower 111 Monument Circle, Suite 3700 Indianapolis, IN 46204-5137 | | | ART UNIT 2835 | PAPER NUMBER |

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/635,101 | MEYER, MICHAEL T. | |
| | Examiner | Art Unit | |
| | Gregory D. Thompson | 2835 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 06 August 2003.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-6 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-6 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 11/24/05 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/8/03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

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1. The drawings are objected to because it appears that figs. 1A-1B should be labeled "Prior Art". Correction is required
2. The disclosure is objected to because of the following informalities: Figs. 1A-1B should be referred to as "prior art" on page 8, lines 13-17.

Appropriate correction is required.

3. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3 are indefinite/confusing which renders claim scope difficult to determine. For example, it appears that the stud in lines 10-12 is the means for inducing phrase change in lines 13-15 of claim 1, and it appears that the structure of the stud in lines 2-3 of claim 2, means for reducing vapor in lines 1-2 of claim 3 is the means for inducing phase change nucleate in lines 13-15 of claim 1. Provide reference numbers for the means for inducing phrase change and means for reducing vapor.

4. Claims 1-2, 4-6 are objected to because of the following informalities: Claim 1, line 9 it appear the language of "liquid coolant module" should be "base plate" since at least one device is mounted to the base plate 5 of the module. Appropriate correction is required.

Claim 1, lines 8 and 11 language of "at least....device" not consistent language since "at least one can" mean one or more but "each" can only mean more.

Claims 4-6 should refer to the liquid coolant positively since claim 1, lines 13-14 first introduces the coolant. For example, claim 4, line 3 should recite "the liquid coolant" for consistent language.

Claims 1-2, 4-6 should provide consistent language when referring to the "stud or studs". Above are just a few examples of inconsistent language.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Chrysler et al.

The claims are rejected insofar as understood from the 112 problems listed above in paragraph 3.

Chrysler discloses a liquid coolant module 9 having a base plate 10 and cover or hat plate 17 defining therebetween a coolant chamber 30, 18 with inlet port 31 and outlet port(s) 44 or 45 in fluid communication with coolant chamber 30, at least one device 12 with a multi-level cooling enhancement cylindrical piston or stud 19, 22 mounted thereon and means for micro fins 36 to induce phase change nucleate boiling of the coolant to enhance cooling performance and reduce vapor buildup from phase change nucleate boiling of the coolant by condensing vapor bubbles from the phase change boiling before they coalesce into larger vapor masses since the surface area of

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the fins 36 would provide greater heat dissipation rate from studs 19, 22 and reduce vapor buildup to stop coalesce into larger vapor masses.

Regarding claim 4, the studs 19, 22 are submerged within the coolant flow through chamber 30, 18 from inlet 30 to outlet 44 or 45.

Regarding claims 5-6, bores 38 induce jet coolant impingement against surfaces of studs 19, 22 in closet proximity (broad) to inlet port 31 which would clear away surface vapors on the surface of the studs for example fins 22 and 36 and bores 38 are considered mini-channel flow passages that direct the coolant flow to the studs at a speed greater than the coolant flow speed through inlet 31.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chrsyler et al in view of Nakayama et al.

The claims are rejected insofar as understood from the 112 problems listed above in paragraph 3.

Chrysler discloses the multi-level studs 19, 22 having a cylindrical core (broad term) with micro fins 36. Chrysler does not teach that the fins 36 have surface textures.

Nakayama discloses porous surface textures on stud 4 in a boiling type cooling apparatus to greatly enhance cooling performance. Therefore, it is considered obvious to one of ordinary skill in the art at the time of the invention to construct surface textures

such as pores taught by Nakayama on the surface of fins 36 in Chrysler so that bubbles can nucleate to greatly enhance cooling performance to avoid device(s) 12 breakdown thus prolonging device(s) 12 life.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Oktay et al, Yamamoto et al, Chao-Fan Chu et al, and Chu et al '991, 497 disclose pistons and studs for cooling.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Thompson whose telephone number is (571)272-2045. The examiner can normally be reached on Mon-thurs from 6:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild, can be reached on (571)272-2800, ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Thompson/ds

05/09/05


Gregory Thompson
Primary Examiner